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# *Indian Standard*

# SPECIFICATION FOR ULTRAMARINE BLUE FOR PAINTS

## *( First Revision )*

Third Reprint APRIL 2000

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**Gr 3** *May* **1971**

# AMENDMENT NO. 2 NOVEMBER 1991
# TO
# IS 55 : 1970 SPECIFICATION FOR ULTRAMARINE BLUE FOR PAINTS

***(First Revision)***

[ *Page* 5, *Table* 1, *Sl No.* (i), *col* 2 ] — Insert 'at 105 ± 2°C' after the word 'matter'.

[ *Page* 5, *Table* 1, *Sl No.* (i), *col* 3 ] — Substitute '1.0' *for* '0.5'.

[ *Page* 5, *Table* 1, *Sl No.* (vi), *col* 3 ] — Substitute '1.5' *for* '1.0'.

( CHD 021 )

Reprography Unit, BIS, new Delhi, India

# AMENDMENT NO. 1 NOVEMBER 1987

# TO

# IS:55-1970 SPECIFICATION FOR ULTRAMARINE BLUE FOR PAINTS

## (*First Revision*)

(*Page* 5, *Table* 1, *foot-note with* '+' *mark*) – Substitute '± 10' for '± 5'.

(CDC 50)

Reprography Unit, BIS, New Delhi, India

( *Continued from page* 1 )

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# *Indian Standard*

# SPECIFICATION FOR ULTRAMARINE BLUE FOR PAINTS

## *(First Revision)*

## 0. FOREWORD

**0.1** This Indian Standard ( First Revision ) was adopted by the Indian Standards Institution on 2 November 1970, after the draft finalized by the Raw Materials for Paint Industry Sectional Committee had been approved by the Chemical Division Council.

**0.2** This standard was first published in 1950 largely based on the *interim* co-ordinated draft produced with the assistance of representatives of manufacturers and of various departments and authorities of the Government of India by the Co-ordinating Subcommittee of the No. 5 Standing Committee on Specifications for Paints and Allied Stores of the General Headquarters India (now Army Headquarters).

**0.3** Since the publication of the original standard, apart from the increase in the production of this material, the pattern of consumption and technique of manufacture have changed considerably. A revision of this standard was, therefore, felt necessary. Metricization achieved through Amendment No. 1 August 1961 to this standard has been incorporated in this revision.

**0.3.1** While scrutinizing ISO Recommendation No. 788 'Ultramarine pigments' of Technical Committee TC/35 Paints, Varnishes and Related Products and Their Raw Materials of the International Organisation for Standardization, it was felt that IS:55-1950* has to be revised to align it with ISO Recommendation and to suit the current product. In this revision, a limit for free sulphur has been introduced and hence it test for determination of sulphur has also been prescribed. Moreover, an identification test to qualitatively assess the material and tests for fastness to light, soluble organic colouring matter, dispersibility have also been added as newer ones.

**0.4** This revision, while incorporating all changes considered necessary through use of the standard, achieves alignment with ISO Recommendation No. 788 'Ultramarine pigments', of the International Organisation for Standardization. Needed co-ordination with revised methods of test ( IS : 33-1963* ) has also been accomplished.

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*Specification for ultramarine blue for paints.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with IS:2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1. SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for the material commercially known as ultramarine blue, intended for use as a paint pigment.

## 2. TERMINOLOGY

**2.1** For the purpose of this standard, definitions given in IS : 33-1963* and IS : 1303-1963‡ shall apply.

## 3. REQUIREMENTS

**3.1 Form and Condition** — The material shall be supplied in the form of dry powder or in such a condition that it may be reduced to the powder form by crushing, without grinding action, under a palette knife.

**3.2 Composition** — The material shall be of uniform character and shall consist solely of compounds of sodium, aluminium, silicon, sulphur and oxygen.

**3.3 Identification Test** — Warm gently approximately 0.1 g of the material with 1:1 (*v/v*) hydrochloric acid in a test-tube. The material shall be identified as ultramarine blue, if the colour is destroyed completely with the evolution of hydrogen sulphide gas, detected by its characteristic brown colouration appearing on a strip of moistened lead acetate paper held above the test tube. Any colour remains after this treatment, it may be interpreted that a foreign pigment is present.

**3.4 Dispersibility** — The dispersibility of the material shall closely match that of the agreed sample when tested as prescribed in Appendix A.

---

*Methods of test for dry pigments and extenders for paints ( *revised* ).

†Rules for rounding off numerical values ( *revised* ).

‡Glossary of terms relating to paints ( *revised* ).

**3.5 Free Sulphur Content** — The material shall not contain more than 0.1 percent by weight of free sulphur when tested as prescribed in Appendix B.

**3.6** The material shall also conform to the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR ULTRAMARINE BLUE FOR PAINTS

| SL No. | CHARACTERISTIC | REQUIREMENT | METHOD OF TEST | |
|---|---|---|---|---|
| | | | Ref to Appendix | Cl No. in IS : 33-1963* |
| (1) | (2) | (3) | (4) | (5) |
| i) | Volatile matter, percent by weight, *Max* | 0.5 | — | 6 |
| ii) | Residue on sieve, percent by weight, *Max* | 0.2 | — | 7 |
| iii) | Oil absorption | 30 to 40† | — | 8 |
| iv) | Colour | Shall closely match to that of the approved sample | – | 9 |
| v) | a) Staining power | Not inferior to the approved sample | — | 10 |
| | b) Under-tone | Equal to the approved sample | — | |
| vi) | Matter soluble in water, percent by weight, *Max* | 1.0 | — | 12 |
| vii) | Alkalinity (as $Na_2CO_3$), percent by weight, *Max* | 0.1 | — | 13 |
| viii) | Fastness to light | Not inferior to the approved sample | C | — |
| ix) | Soluble organic colouring matter | To pass the test | D | — |

*Methods of test for dry pigments and extenders for paints ( *revised* ).

†It shall be, however, within ± 5 percent of the sample approved against this specification.

## 4. PACKING AND MARKING

**4.1 Packing** — The material shall he suitably packed as agreed to between the purchaser and the supplier.

**4.2 Marking** — The containers shall be marked with the name of the material; manufacturer's name or trade-mark, if any; weight of the material; and the lot and the batch number.

**4.2.1** The product may also be marked with Standard Mark.

**4.2.2** The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manfucaturers or producers may be obtained from the Bureau of Indian Standards.

## 5. SAMPLING

**5.1** Representative samples of the material shall be drawn as prescribed under **3** of IS : 33-1963*

## 6. TEST METHODS

**6.1** Tests shall be conducted as prescribed in IS : 33-1963* and in Appendices A to D. References to relevant clauses of IS:33-1963* are given in col 5 of Table 1 and to Appendices mentioned in **3.4, 3.5** and col 4 of Table 1.

**6.2 Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water *(see* IS :1070-1960†) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

# APPENDIX A

*(Clause* 3.4)

## TEST FOR DISPERSIBILITY

## A-0. GENERAL

**A-0.1 Outline of Method** — A parte is prepared from zinc oxide, linseed oil and material. The rubdown of this paste is compared with a similar rubdown from the agreed sample, zinc oxide and linseed oil.

## A-1. APPARATUS

**A-1.1 Glass Plate** — ground, of size 300 × 400 mm.

**A-1.2 Palette Knife** — of steel and having a tapered blade of 140 to 150 mm long, 20 to 50 mm wide at its widest point and not less than 12.5 mm wide at narrowest point.

---

*Methods of test for dry pigments and extenders for paints ( *revised* ).

†Specification for water, distilled quality ( *revised* ).

**A-1.3 Glass Slides** — clear, colourless and of size 150 × 50 mm.

**A-1.4 Burette** — 25 ml graduated in 0.1 ml divisions (conforming to IS : 1997-1961* ).

## A-2. MATERIALS REQUIRED

**A-2.1 Acid Refined Linseed Oil** — conforming to IS : 75-1967†.

**A-2.2 Zinc Oxide** — conforming to IS : 35-1950‡.

## A-3. PROCEDURE

**A-3.1** Weigh accurately about 2 g of zinc oxide and 0.2 g of the agreed sample. Place together on the glass plate and add, 1.3 ml of linseed oil. Rub the mixture with palette knife lightly until the mixture becomes homogeneous.

NOTE — The particle size of the pigment should not be reduced by hard rubbing otherwise it will be found difficult to get reproducible results.

Repeat the test using the test sample in an exactly similar manner and compare the test sample with the agreed sample by spreading the two mixtures so prepared, in the same direction on the glass slide in opaque strips of not less than 25 mm wide, with touching edges not less than 40 mm long.

Make a colour comparison by viewing the strips in diffuse day light through the glass and on the surfaces immediately after application.

The material shall be deemed to have passed the test if the strip of the test sample closely matches with that of the strip made from approved sample.

# APPENDIX B

(*Clause* 3.5)

## DETERMINATION OF FREE SULPHUR

## B-0. GENERAL

**B-0.1 Outline of Method** — The material is extracted with chloroform, as solvent in soxhlet apparatus, and the solvent evaporated from the extracted material. The amount of free sulphur is calculated from the residue left after evaporation.

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*Specification for burettes. ( Since revised )

†Specification for linseed oil *( first revision ).*

‡Specification for zinc oxide for paints.

## B-1. APPARATUS

**B-1.1 Soxhlet Apparatus**

## B-2. REAGENT

**B-2.1 Chloroform** — neutral and pure (*see* IS : 5296-1969* ).

## B-3. PROCEDURE

**B-3.1** Weight accurately about 60 g of the material and extract with sufficient quantity of chloroform in a soxhlet apparatus for about 4 hours. Distil off the contents and evaporate the residue to dryness at 60°C. Weigh the residue obtained.

**3.2 Calculation**

$$\text{Free sulphur, percent by weight} = 100\frac{W_1}{W_2}$$

where

$W_1$ = weight in g of residue, and
$W_2$ = weight in g of the material taken.

# APPENDIX C

[*Table* 1, *Item No.* (viii)]

## TEST FOR FASTNESS TO LIGHT

## C-0. GENERAL

**C-0.1 Outline of Method** — Painted panels made from material and approved sample are exposed half covered to carbon arc lamp radiation for specific period and examined for fade in colour.

## C-1. APPARATUS

**C-1.1 Light Source** — artificial light source of carbon arc type.

## C-2. PROCEDURE

**C-2.1** Prepare a paste of the material as prescribed in **10** of IS : 33-1963† and apply the paste uniformly and evenly on to a colourless glass plate. Allow the film to dry. Similarly prepare a film of the material using approved sample. Protect half of the portion of the painted glass panels from light by opaque material like aluminium foil. Arrange the glass panels at a distance of 250 mm from the carbon arc lamp. Maintain the temperature of the atmosphere surrounding the specimens throughout the period of exposure between 25° to 50°C. Expose the film to light for 20 hours and then examine for any change in colour. If no appreciable change it noticed, another cycle of 20 hours is given but to the maximum of 3 cycles. At the end of the period, compare the colour of the panels and with other halves also.

---

*Specification for chloroform, technical and analytical.

†Methods of test for dry pigments and extenders for paints ( *revised* ).

**C-2.2** The material shall be deemed to have passed the test if fading with the material under test is not more than of the approved sample.

## APPENDIX D

[*Table* 1, *Item No.* (ix)]

## TEST FOR SOLUBLE ORGANIC COLOURING MATTER

### D-0. GENERAL

**D-0.1 Outline of Method** — To a boiling solution of the material in ethanol, sodium hydroxide solution and acetic acid are added separately and examined for any development of colour.

### D-1. REAGENTS

**D-1.1 Ethyl Alcohol** — 95 percent *(v/v),* conforming to IS : 323-1959*

**D-1.2 Acetic Acid** — 10 percent *(v/v).*

**D-1.3 Sodium Hydroxide Solution** — approximately 4 N.

### D-2. PROCEDURE

**D-2.1** Add to ethyl alcohol in a beaker, a small quantity of the material and bring to boiling. Divide the boiling solution into two parts and take in two test tubes. To the test tubes, add a few ml of acetic acid and sodium hydroxide respectively. Observe the colour of the liquid in the test tubes.

**D-2.2** The material shall be deemed to have passed this test if the liquids remain colourless.

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*Specification for rectified spirit ( *revised* ).

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